



Introduction

The purpose of this section is to acquaint the novice with the basics of Intune software operation. As part of normal operation, the Intune software modifies atoms in the DCU database. This gives rise to concerns about security, which is discussed in [Section 6](#).

For the purposes of this section, it is assumed that as a minimum, a DCI System Six/Conductor user named AAG, with an access level of Supervisor Level 3, has been configured. (Refer to [Set Up a Temporary Default Intune Client Proxy](#) in [Section 3](#).)

The two main Intune tools used to tune a controller are:

- Auto Tune.
- Adapt Tune.

Auto Tune

The Auto Tune feature is a one-time procedure for tuning a process control loop.

Configure

Before starting the Intune software, be sure the @aGlance/IT server and @aGlance/IT DDE bridge software are running. Refer to [Section 4](#) for information on starting these items.

To start the Intune software, select:

Start > Programs > Intune > Intune

Click *OK* to close the window. From the Intune window menu bar, select:

Tuning and Diagnostics > Configure Loop

In the *Loop Settings* portion of the window:

- Enter a name in the *Loop Name* entry box.



- Enter the engineering units that apply for the loop being tuned.
- Select *DDE* in the *Driver* entry box.

In the *Auto Tune* portion of the window, locate the *Test Type* entry box and:

- Select *Open Loop* to tune the loop with the controller in manual mode. In this case, the output of the controller is the variable that will be adjusted by the Intune software.

- or -

Select *Closed Loop* to tune the loop with the controller in automatic mode. In this case, the set point of the controller is the variable that will be adjusted by the Intune software.

- Select the *Process Type* that best fits the control loop being tuned.
- When *Open Loop* has been selected, Set *Auto Trend Time* to *On* if you want Intune to determine the duration of your tuning trend. If *Auto Trend Time* is set to *Off*, then set the *Trend Duration* field appropriately for the loop being tuned. The *Trend Duration* should be at least twice the time it takes for the PV to react to an output change.
- Set the *Step Size %* (*CO Step Size %* if *Open Loop* was selected, or *SP Step Size %* if *Closed Loop* was selected.) This setting determines the magnitude of disturbance that Intune will inject into the loop during the tuning process.

In the *Tuning Settings* portion of the window, select *Auto Tune* as the *Function* type.

Click on *Control Loop* (in the *Loop Settings* portion of the window) to continue. The control loop window will be displayed.

Configure Control Loop

The *DDE Input Items* portion of the control loop window provides entry boxes for the tagname.atom of specific CON module atoms which will provide input to the Intune software. These atoms, and the corresponding Controlware II atom names, are listed in Table 5-1.

Table 5-1. Controlware II and Intune Designations

Description	Intune Designation	Controlware II Atom Name	Example
CON module output in engineering units	CO	OUT	Excon01.OUT
Controller mode (auto or manual)	Controller mode	AUT	Excon01.AUT
Derivative time in minutes	D	TD	Excon01.TD
Integral (reset time in minutes)	I	TR	Excon01.TR
Process variable	PV	PV	Excon01.PV
Proportional (controller gain)	P	KC	Excon01.KC
Set point	SP	SP	Excon01.SP

In the appropriate entry box, enter the tagname.atom for each Controlware II atom from which the Intune software will read data.

NOTE: Use *Duplicate Item* to simplify the text entry process. Click this button, then enter the tag name of the CON module. The tag name will be duplicated in all the DDE fields. Append the appropriate atoms in these fields.

Similarly, in the *DDE Output Items* portion of the window, enter the tagname.atom for each CON module atom to which the Intune software will write data.

In the *Controller Mode Value* portion of the window, select:

Use 1 for Auto, 0 for Manual

In the *DDE Data Ranges* portion of the window, enter the high and low values to define the ranges for the process variable and the output of the CON module being tuned.

Click *OK* to proceed to the next window.

Set *Controller Type* to *Controlware II*.

The *Eng. Unit High* and *Eng. Unit Low* settings should correspond to the *PV High* and *PV Low* settings configured in the preceding window.

The *CO High (%)* and *CO Low (%)* settings should correspond to the *CO High* and *CO Low* settings configured in the preceding window.

Click *OK*; the original Intune configuration window will be displayed.



Click *Communication*. In the communication window, the *Server* entry box should always contain the entry *AAGDDE*.

In the *Topic* entry box, enter the name of the @aGlance/IT server from which the data will be obtained (for example, EB1CON22).

Be sure that *Verify With Cold-links* and *Read Initial Values* are both checked. Click *OK* to return to the original setup window.

Click *OK* to finish the Intune setup procedure.

If this is a new configuration session, or if the configuration has changed, a confirmation box will prompt you to save the configuration, and a window to save the loop setup will be displayed. This window allows you to specify the directory and file name in which to save the configuration information.

Exit and restart the Intune software.

Operation

To start the Auto Tune feature, click *Express Tune* on the Intune toolbar or select *Tuning and Diagnostics > Express Tune* from the Intune window menu bar. Verify the settings, then click *OK*. The Intune express tune window will be displayed.

In the express tune window, the top display trends the SP and PV values for the controller (CON module) being tuned. The lower display trends the output (OUT) value for the controller. In an operator window on an operator station, open the point display for the CON module, and in that window change one or more of these values to verify that Intune is monitoring the process properly.

To begin the tuning process, click *Go*. A bump to the controller's output (if *Open Loop* was selected) or set point (if *Closed Loop* was selected) should be seen shortly. After a while, the Intune software will bump the SP or OUT value again. Use the *Show Status* pushbutton to display a window indicating the progress of the tuning procedure.

When the Intune software has recorded enough process samples, a window prompts:

Press the Tune button to calculate PID value

When the Tune button on the Intune toolbar is clicked, the original, current, and calculated PID values for the selected PID speed (response time) will be displayed.

Click *Download PID* to download these values to the DCU3200.

The initial tuning process is complete. you may elect to repeat the express tune procedure again with different settings (*Closed Loop* vs. *Open Loop*, *Fast* vs. *Slow* PID speed, and so on) to improve the tuning values.

Adapt Tune

The Adapt Tune feature is an expert-based tuning function for tuning a control loop with time varying process dynamics. It is part of the Intune loop diagnostics function.

The Adapt Tune feature continuously monitors the control loop while the process is running. It automatically updates PID values, and can be configured to prompt for confirmation before the update occurs.

Configure

Before starting the Intune software, be sure the @aGlance/IT server and @aGlance/IT DDE bridge software are running. Refer to [Section 4](#) for information on starting these items.

To use the Adapt Tune feature, start the Intune software, and select *Tuning and Diagnostics* from the Intune window menu bar.

In the *Loop Settings* portion of the window:

- Enter a name in the *Loop Name* entry box.
- Enter the engineering units applicable to the loop being tuned.
- Select *DDE* in the *Driver* entry box.

Eng. Unit High and *Eng. Unit Low* settings should correspond to *PV High* and *PV Low* configured in the preceding window.

CO High (%) and *CO Low (%)* settings should correspond to *CO High* and *CO Low* configured in the preceding window.



In the *Tuning Settings* portion of the window, select *Loop Diagnostics* as the *Function* type.

Click on *Control Loop* to continue. The control loop window will be displayed.

Configure the *DDE Input Items*, *DDE Output Items*, *DDE Data Ranges* and controller mode value, as described in **Configure Control Loop**. Click *OK* to proceed to the next window.

Set *Controller Type* to *Controlware II*.

Click *OK*; the original Intune configuration window will be displayed.

During an Adapt Tune session, Intune monitors a live control loop and updates the PID controller settings when necessary. If you would like the Intune software to prompt you before it actually makes changes to the process loop settings, go to the *Loop Diagnostics Settings* portion of the window and set the *Diagnostic Mode* to *Advisory*.

Also in the *Loop Diagnostics Settings* portion of the window, adjust the *Response Time*, *Analysis Time*, *Error Range*, *Noise Band*, and *PID Speed* settings for your process loop.

Click *Communication*. In the communication window, the *Server* entry box should always contain the entry *AAGDDE*.

In the *Topic* entry box, enter the name of the @aGlance/IT server from which the data will be obtained.

Be sure that the options *Verify With Cold-Links* and *Read Initial Values* are both checked.

Click *OK* to finish the Intune communication setup procedure.

Click *OK* to close the Intune configure loop window.

If this is a new configuration session, or if the configuration has changed, a confirmation box will prompt you to save the configuration, and a window to save the loop setup will be displayed. This window allows you to specify the directory and file name in which to save the configuration information.

Exit and restart the Intune software.

Configure a Display

Before starting an Adapt Tune tuning session, you must first configure a display. To do so, select from the menu bar of the Intune window:

Tuning and Diagnostics > Configure Display

The configure display window will appear. In the *Loops* portion of this window, click *Add*. A window displaying available loop configurations will be displayed. Select the one that is appropriate for this Adapt Tune session.

In the *Windows* portion of the configure display window, click *Add*. A configure window pop-up will be displayed. In this window, set the *Display Type* to *Loop Diagnostics*. Click *OK* to close the configure window pop-up.

Click *OK* on the configure display window. A pop-up window prompts you to save changes. Select *Yes*. Enter the file name in which to save the information (for example, **adapt.trd**), then click *OK*.

Operation

To start the Adapt Tune feature, from the Intune window menu bar select:

Tuning and Diagnostics > Start Trend . . .

Select the display configured in the preceding sub-section, ***Configure a Display***.

A set of four windows will be displayed:

- Event Log - Shown in the upper left portion of the screen, this window shows process loop events detected by the Intune software (for example, set point changes).
- Controller (PV or SP) Trend - Shown in the upper right portion of the screen, this display tracks the value of the PV and SP atoms.
- Error Distribution - Shown in the lower left portion of the screen, this display shows the SP-PV error distribution. The span of the chart is configured during loop configuration by the value specified in the *Error Range (eu)* entry box



(located in the *Loop Diagnostics Settings* portion of the initial loop configuration window).

- Controller Output Trend - Shown in the lower right portion of the screen, this display tracks the value of the OUT atom.

While the Adapt Tune feature is in use, it will monitor the process loop and continuously recalculate the PID values. If the *Diagnostic Mode* setting for the loop was set to *Automatic*, the Intune software will update the PID settings automatically (without notifying the operator before a change is made). If the *Diagnostic Mode* was set to *Advisory*, a confirmation window will be displayed before new PID settings are written to the controller in the DCU.

The Adapt Tune feature monitors a process and makes adjustments based on changes detected; it requires a dynamic process to be effective.

Intune File Types

A number of different file types are created by the Intune software. The two main types of files are:

- Loop configuration files (*.set).
- Display configuration files (*.trd).

Other types of files created by the intune software include:

- Data files (*.dat).
- Results files (*.res).
- Event log files (*.evt).
- Error distribution files (*.err).
- data logging files (*.log).

For detailed information on these file types and their contents, refer to the *Intune User's Manual*.